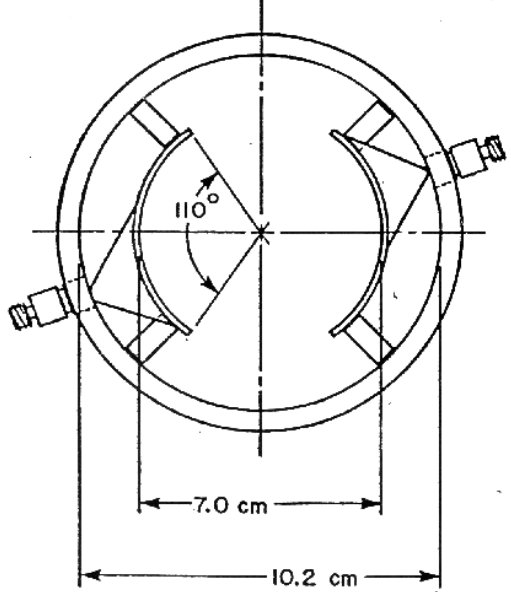


Tevatron BPM Upgrade Project Manager Overview

Stephen Wolbers

Tev BPM Technology Choice Review

December 16, 2003

Outline of today's talks

wwwserver2.fnal.gov/tevbpm/reviews/tech_choice/

- Overview - Steve Wolbers
- Key requirements - Mike Martens
- Current hardware direction - Jim Steimel
- P/Pbar embedding technique – Rob Kutschke
- Hardware options and Technology Choice - Vince Pavlicek
- Summary - Bob Webber

Outline of this talk

- Project definition
- Short history
- Management/organization
- Project plan/wbs/effort/milestones
- Accomplishments so far
- Issues, what we are asking from this review
- Summary

Project Definition

- The Tevatron BPM Upgrade Project will replace the current BPM electronics and the data acquisiton system used to transfer information between the BPMs and the Accelerator Controls Systems. As part of the project, the software used to read out, transfer, store, and analyze the BPM data will be upgraded. The goal of the project is to provide a BPM system based on modern hardware and software that gives the higher resolution and expanded functionality necessary to efficiently understand and operate the Tevatron Collider now and for the forseeable future. Deliverables of the project include all relevant documentation, manuals, users guides and any other written records necessary for maintaining the system.

  The project includes replacing the Tevatron BLM system interface hardware and software that is tightly coupled to the BPM system.

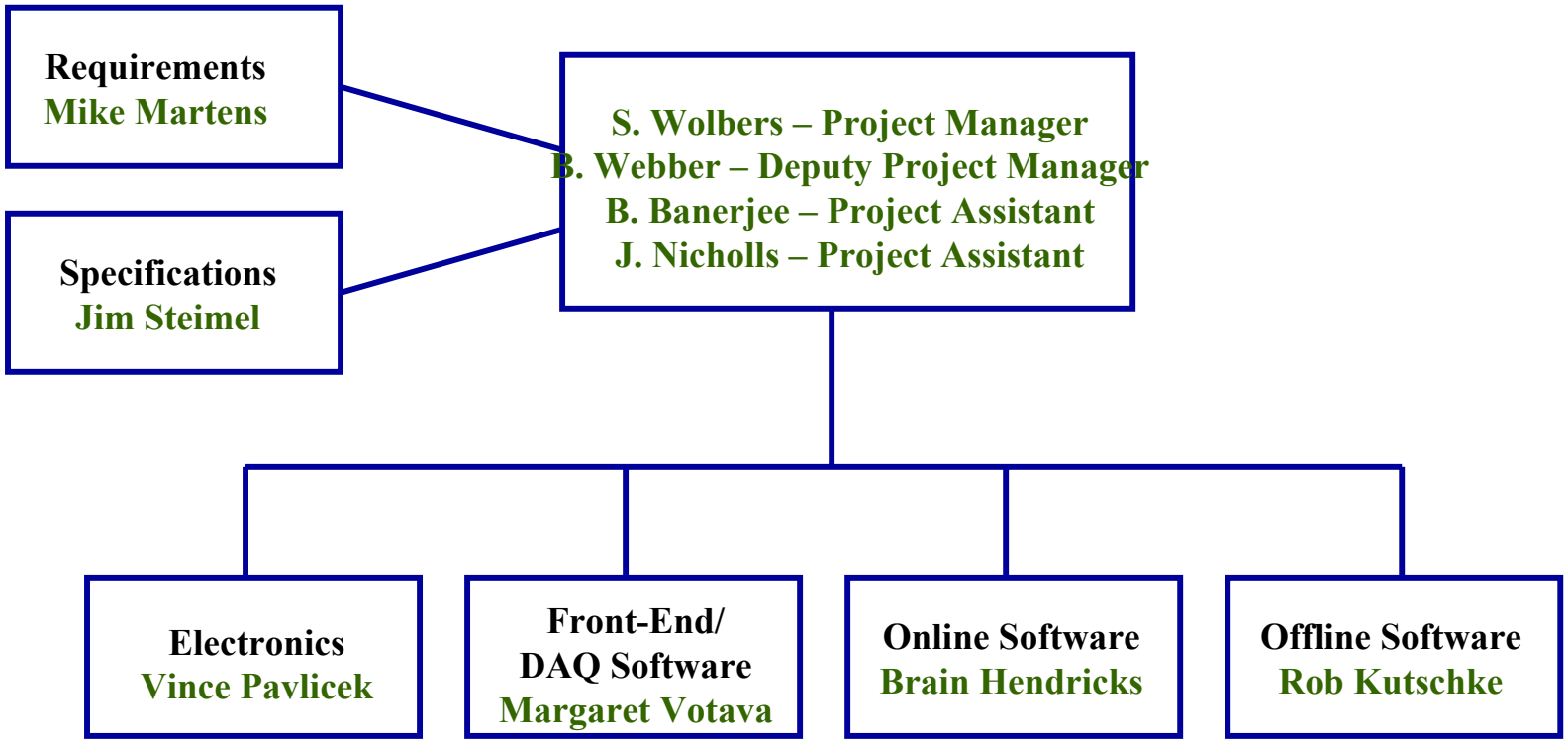
Partial Project History

- Steve Wolbers joined the effort as Project Manager in mid-July, 2003.
- August-September was spent getting "up to speed":
  - Most of us are not accelerator instrumentation experts
  - There was a need to talk the same language, understand the same concepts
  - There was also a large amount of vacation to deal with in this time-frame.
- September-present: serious planning and analysis toward picking a hardware solution and understanding the needs of the system.

Project management organization

- The project is a joint Accelerator Division/Computing Division project.
- It is a subproject of the Run 2 upgrade project, which is headed by Jeff Spalding and Dave McGinnis.
- We report to many people, and try to keep them all informed.
- It is highly likely (100%?) that the project will become an AIP project (Accelerator Improvement) shortly.

Tev BPM Upgrade Project Organization



Project Planning

- A wbs has been developed for the project. There are 5 major "tasks" and 4 major subtasks in this structure.
- The 5 tasks are:
  - Development, Fabrication, Installation, Commissioning, Project Management
- The 4 subtasks are:
  - Electronics, Front-end Software, Online Software, Offline Software
    - Note that Requirements and Specifications are a part of the Project Management

Project Planning

- Up to now the wbs has been developed with no specific hardware solution in mind.
- As such, it does not represent a complete and accurate picture of the time and resources required to do the project.
- However, we believe that it is good enough to understand the approximate level of manpower to actually do the project, with many caveats.

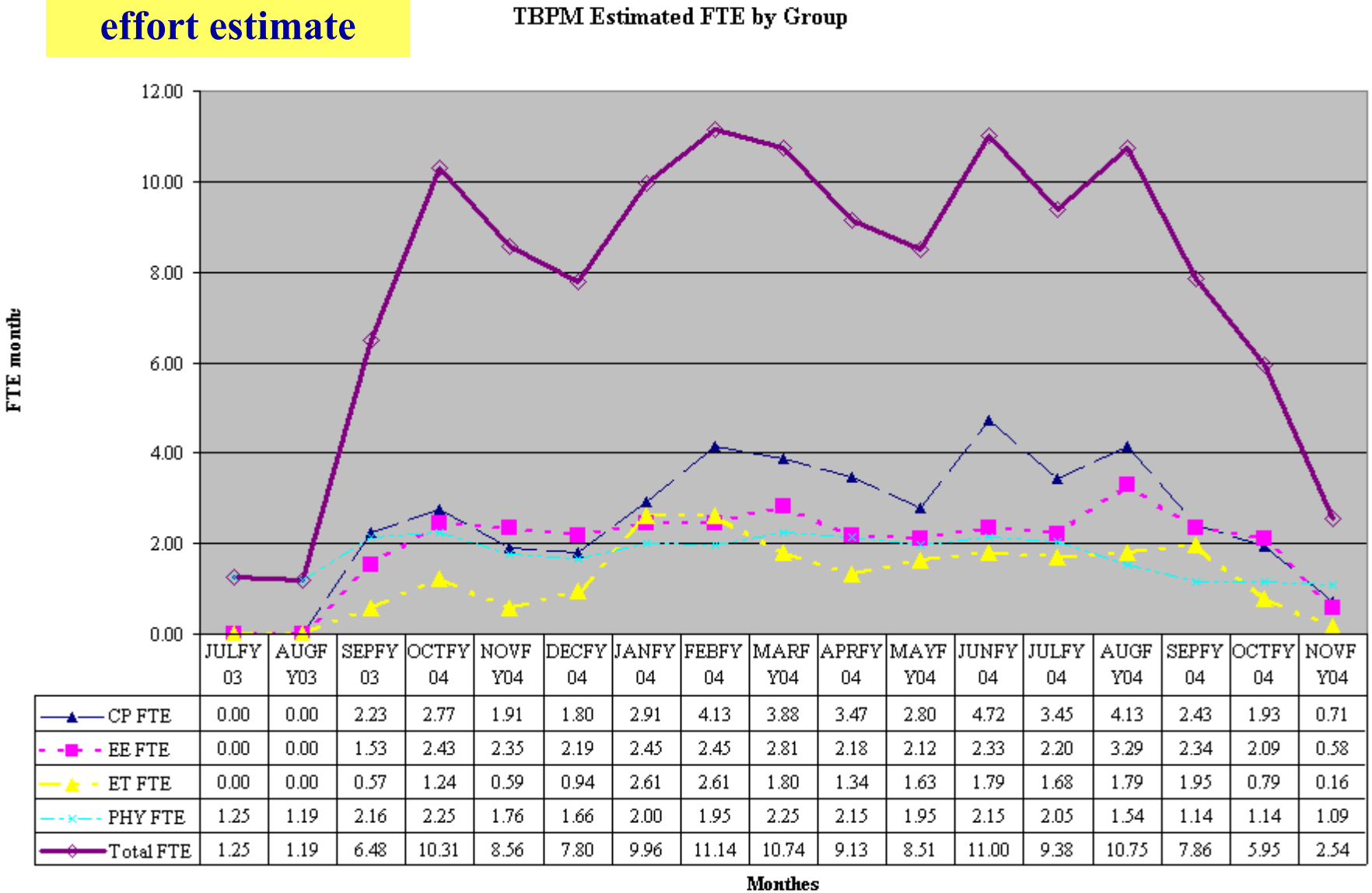
Project Planning

- An important part of planning is the handoff to "operations" and the long-term support of the hardware and software developed as part of the project.
- A roll up of the effort estimates shows a steady-state effort of about 10-11 FTE working until next autumn.

People Available

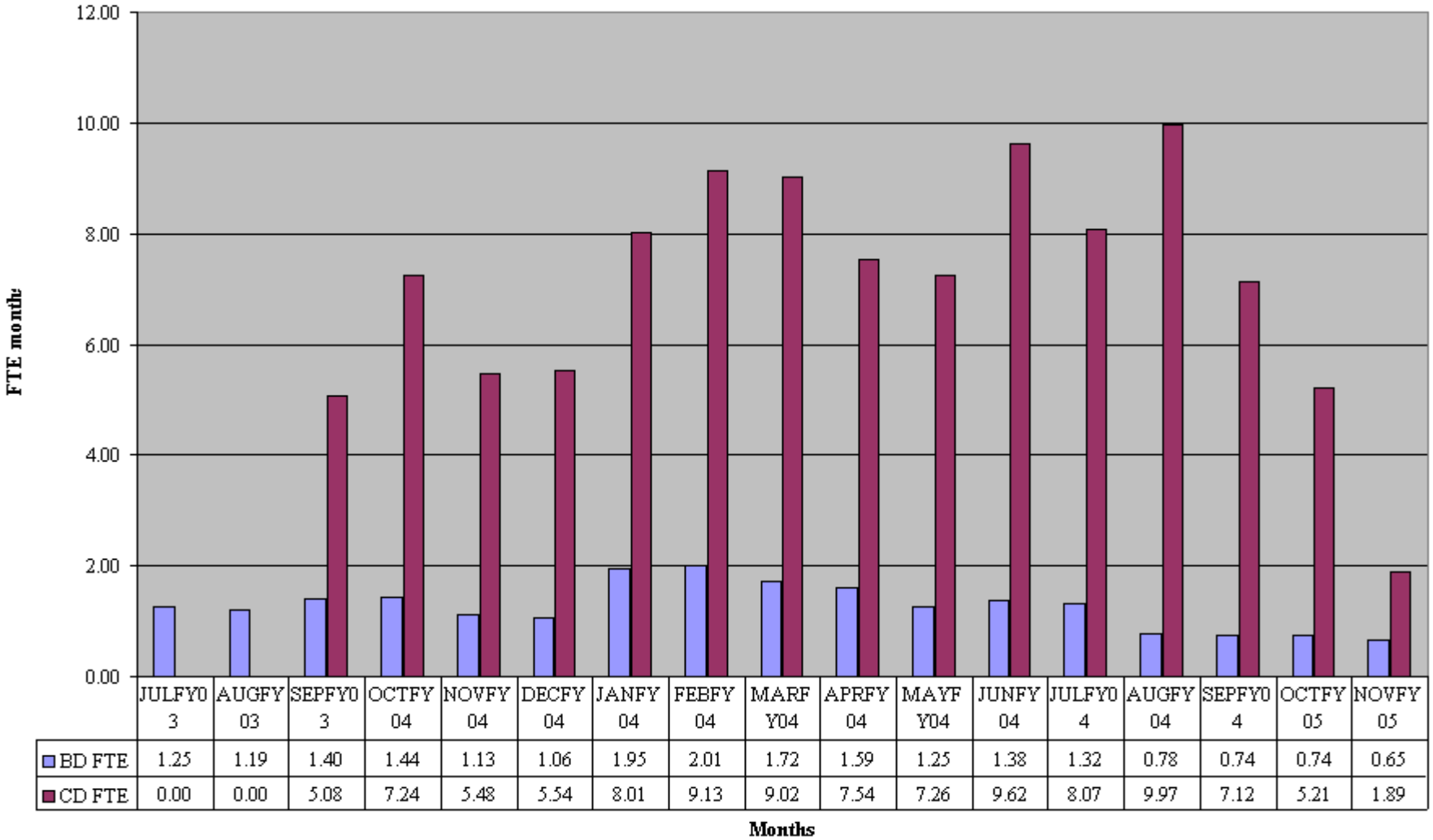
- AD and CD have many people working hard on the project.
  - Project subtask leaders
  - Project management
  - Others in AD and CD.
- We will draw in more people as required.
  - AD/CD is committing Engineering and Software support and has identified this project as high priority in the Divisions.

First complete wbs effort estimate



	JULFY 03	AUGF Y03	SEPFY 03	OCTFY 04	NOVF Y04	DECFY 04	JANFY 04	FEBFY 04	MARF Y04	APRFY 04	MAYF Y04	JUNFY 04	JULFY 04	AUGF Y04	SEPFY 04	OCTFY 04	NOVF Y04
CP FTE	0.00	0.00	2.23	2.77	1.91	1.80	2.91	4.13	3.88	3.47	2.80	4.72	3.45	4.13	2.43	1.93	0.71
EE FTE	0.00	0.00	1.53	2.43	2.35	2.19	2.45	2.45	2.81	2.18	2.12	2.33	2.20	3.29	2.34	2.09	0.58
ET FTE	0.00	0.00	0.57	1.24	0.59	0.94	2.61	2.61	1.80	1.34	1.63	1.79	1.68	1.79	1.95	0.79	0.16
PHY FTE	1.25	1.19	2.16	2.25	1.76	1.66	2.00	1.95	2.25	2.15	1.95	2.15	2.05	1.54	1.14	1.14	1.09
Total FTE	1.25	1.19	6.48	10.31	8.56	7.80	9.96	11.14	10.74	9.13	8.51	11.00	9.38	10.75	7.86	5.95	2.54

Current estimated effort for the Project by Division



	JULFY03	AUGFY03	SEPFY03	OCTFY04	NOVFY04	DECFY04	JANFY04	FEBFY04	MARFY04	APRFY04	MAYFY04	JUNFY04	JULFY04	AUGFY04	SEPFY04	OCTFY05	NOVFY05
BD FTE	1.25	1.19	1.40	1.44	1.13	1.06	1.95	2.01	1.72	1.59	1.25	1.38	1.32	0.78	0.74	0.74	0.65
CD FTE	0.00	0.00	5.08	7.24	5.48	5.54	8.01	9.13	9.02	7.54	7.26	9.62	8.07	9.97	7.12	5.21	1.89

Milestones – still being developed

ID		WBS	Name	Duration	Pred.	Start	Finish
1		1.1.1	Tev BPM: Requirements Review (Milestone)	0 days		9/22/03	9/22/03
2		1.1.3.1.2	Core HW technical choice review	0 days		12/15/03	12/15/03
3		5.2	BPM/BLM system specification review	0 days		2/16/04	2/16/04
10		1.1.6	Electronics design review complete	0 days	9,18	4/28/04	4/28/04
11		2.3.2	Online SW code complete	0 days	86	4/30/04	4/30/04
13		2.4.2	Offline SW code complete	0 days	94	4/30/04	4/30/04
27		3.1.10	Test plan for system commissioning complete	0 days		7/30/04	7/30/04
28		4.1.1	Begin system commissioning	0 days		8/2/04	8/2/04
29		4.1.5	Electronics comissioning complete	0 days	129	10/18/04	10/18/04
30		5.4	BPM SW specification verification review complete	0 days	150	11/29/04	11/29/04
38		1.2.1.1	Begin SW design	1 day		9/2/03	9/2/03
48		1.3.2	BPM SW specification-online-review complete	1 day	50	1/9/04	1/9/04
49		1.4.2	BPM SW specification-offline-review complete	1 day	53	1/9/04	1/9/04
51		1.2.2	BPM SW specification-frontend DAQ - review complete	1 day	31	1/23/04	1/23/04
52		1.2.4	BPM SW design - frontend DAQ - review complete	1 day	39	4/26/04	4/26/04
54		2.2.2	Frontend DAQ implementation document - review complete	1 day	76	5/26/04	5/26/04
55		2.2.4	Frontend DAQ SW code complete	1 day	83	7/6/04	7/7/04
56		3.1.9	All Tev BPM crates functionally available	1 day		7/30/04	7/30/04
73		3.3.2	Online SW integration complete	1 day	119	7/30/04	7/30/04
74		3.4.2	Offline SW integration complete	1 day	122	7/30/04	7/30/04
75		2.1.3	Procurement - BPM PO complete	1 day	65	8/2/04	8/2/04
82		4.3.2	Online SW released	1 day	138	8/16/04	8/16/04
84		4.4.2	Offline SW released	1 day	143	8/16/04	8/16/04
85		2.1.4	Promote test stand to acclerator w/production HW	1 day	67	9/3/04	9/3/04
91		3.1.5	First production qualty crate available	1 day	107	9/20/04	9/20/04
93		3.1.7	Design validation complete	1 day	108	9/21/04	9/21/04
97		4.2.2	Frontend DAQ SW released	1 day	133	9/23/04	9/24/04
99		5.6	End system commisioning with fully loaded HW/SW	1 day		11/11/04	11/11/04
100		5.7	BPM HW/SW system validation review	1 day	153	11/12/04	11/12/04

A Few Key Project Accomplishments

- Requirements document and review.
- Choice of technique for p/pbar separation (more about this from Jim Steimel and Rob Kutschke).
- Analysis of measurements from Tevatron BPM's.
- Work in the tunnel during the shutdown to enable readout of the p and pbar ends of each BPM (using MR cables).
- BLM (Beam Loss Monitor) interface electronics prototyping.
- Software specification for the online and offline software.

Cables ready for electronics

BPM Pickup Ports In the tunnel

Important Project Issues

- The measurement of proton and antiproton positions (and intensities) is an important and difficult technical issue for the project. You'll hear many details about this from Mike Martens, Jim Steimel, and Rob Kutschke.

Project Issues(2)

- The project has narrowed the hardware solutions to 5 viable choices:
  - Echotek, Modified Echotek, DSR, Modified DSR, Damper
  - Details of the 5 choices will be shown by Vince Pavlicek in his talk.
- The project has chosen the Modified Echotek as its hardware direction.

What the project would like from this review

- The Tev BPM Upgrade project has chosen a frequency domain technique to measure beam positions.
- The focus has been on specific hardware choices for the core electronics.
- We would like the reviewers to look at the measurement technique and we would like advice on the direction we are taking and the specific choice of hardware.
- Comments on the general areas of staffing, organization, management would be useful.

Summary

- The Tevatron BPM Upgrade Project is a joint Accelerator Division-Computing Division Project and it is up and running.
- Our plan is to choose the core electronics, design the complete system, including the Front-end, Online and Offline Software, and then to build, install, and commission the complete system during 2004.
- The remaining talks will give more details about the requirements, the measurement techniques and the hardware solutions we have examined.